

## EXPERT ADVICE ON RADIO

No. 50.—Broadcasting Power.

BY A. HYATT VERRILL

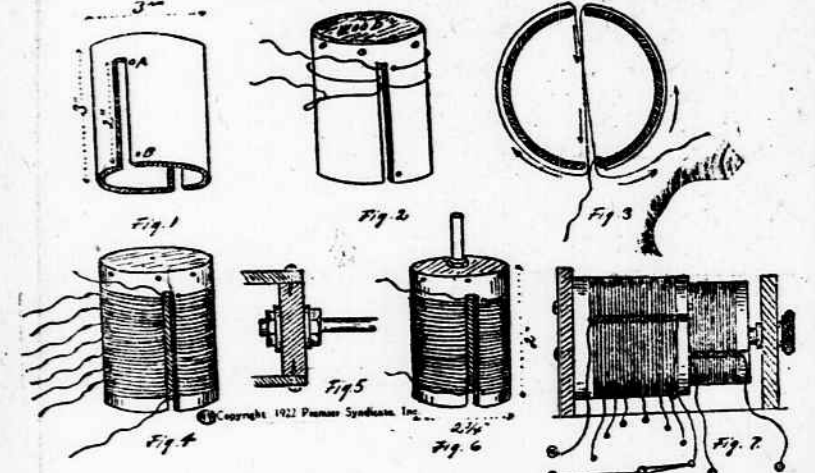
Expert on Radio Technology.

When the news was flashed recently that the battleship Iowa would be controlled solely by radio on her journey to destruction, few realized the real significance of the gigantic experiment.

Not a single officer or man was aboard the giant vessel, yet smoothly she was guided through channels, past buoys and far into the ocean, just as though manned by one of Uncle Sam's ablest crews.

One single man guided the ship's destiny, and he was not aboard, but far away on shore, seated comfortably in a little room miles distant, presumably listening to a radio instrument. From this unpretentious setting, giant waves of power were sent out to guide the engines, control the propeller, and guide the great ship to her destination.

Only before the war set forth on her crewless voyage, experiments had been made on controlling various me-



chanical devices by means of radio. Clocks had been stopped and started, incandescent lights turned on and off, and miniature boats maneuvered by means of wireless. The Iowa's cruise was the greatest achievement of its kind ever accomplished by radio.

**Endless Made It Possible.**

The vacuum tube with its amplifying powers played an important part in the remarkable feat—indeed, it was the vacuum tube which made it possible. With the tube an electrical device known as a "relay" was used. This is an apparatus by means of which a weak electrical current can be made to control a strong current, and it is widely used in many other electrical devices. A number of relays are often used to control one piece of machinery, the weakest relay controlling the larger one, the latter controlling a still larger one, and so on until the desired strength is gathered. Thus you can understand that by means of amplifying tubes the weak radio signals may be built up until they produce a current strong enough to operate a relay which, in turn, may be arranged to control the heaviest machinery of a battleship.

But, you ask, how may the operator turn that he is sending an impulse which would turn the rudder to the left and not to the right? If you look at the accompanying diagram you will see that the amplifier of the radio set connects with a small relay, which in turn operates a large relay by means of a magnet, which pulls down an arm or lever. At one end is a pawl bearing upon a ratchet wheel and each time the large relay magnet pulls down the lever the pawl turns the ratchet wheel one notch.

Connected with the ratchet wheel is a switch with numerous contact points and each of these is, in turn, connected to the controls of the engines, rudders, fuel-feeding devices, lighting, etc. The operator naturally knows the mechanisms controlled by each point of the switch, and the number of teeth in the ratchet wheel, which must be moved to bring any point in contact, consequently he can control everything.

**Notched Wheel Controls.**

For example, if one tooth of the wheel starts the boiler feed pump,

all the operator has to do is to send one impulse through the relays, thus pulling the lever and turning the ratchet wheel, one notch. Instantly the feed pumps, operated by electrical motors, start pumping the water into the boilers. Again, the operator may wish to stop the ship. He knows that three notches of the wheel control the electrical motor, closing the great steam valves in the engine room; that three more impulses properly directed through the ether will cause the huge pistons to stop and finally bring the ship to a standstill.

Of course we are not attempting to explain the intricate devices used in this experiment with the Iowa, but the simple description will give you some idea of the principle upon which they work.

And just what is the significance of this experiment? Who can tell if the radio future great here, or not, speed oceanward unmaned by crews aboard, but with the officers seated away, miles away, controlling the destiny of their ships via radio? For science has proven that power, as well as music and entertainment, can be broadcast.

(Copyright, 1922.)

**BY RADIO TODAY**

Complete Programs of Radio Broadcasting Stations.

**N.A.—Naval Radio Station, Radio, Va.**  
8:45 to 9 a.m.—Live stock reports; live stock markets.  
9 a.m.—Weather forecast for New England, New York, Pennsylvania, Virginia, Maryland, the District of Columbia, North and South Carolina, Georgia, Florida, Alabama, Mississippi, Tennessee, Kentucky, West Virginia and Ohio on 2,550 meters.  
10:30 a.m.—Meteorological report on 5,550 meters.  
11:15 to 11:30 a.m.—Hog flash—Chicago and St. Louis.  
11:30 to 11:40 a.m.—Fruit and vegetable shipments.  
Noon.—Time signal; weather report and ship orders on 2,550 meters.  
1:40 to 2:25 p.m.—Fruit and vegetable markets.  
2:25 to 2:55 p.m.—Crop reports and special market news.  
3:45 to 4 p.m.—Closing live stock markets.  
4 to 4:15 p.m.—Hay and feed markets.  
5 p.m.—Weather report.  
5:30 to 6 p.m.—Daily marketgram.  
10 p.m.—Time signal; weather report; ship orders; 2,550 meters.  
10:30 p.m.—Naval press news on 2,550 meters.  
Except where noted, sending is CW 5,550 meters.

**WIX—Post Office Department.**  
10 p.m.—Weather report for the District of Columbia, Pennsylvania, Ohio, Maryland, Virginia and West Virginia.  
10:30 a.m.—Marketgram (fruit and vegetables) on 1,100 meters.  
12:30, 2:15 and 3:30 p.m.—C. W. marketgram telegrams on 1,350 meters.  
7 p.m.—Wholesale dairy report on 1,100 meters by radiophone.  
8 and 8 p.m.—Market report on 1,150 meters by radiophone.  
9:30 p.m.—Weather report.

**WFM—Thomas J. Williams, Inc.**  
(350 Meters).  
12:30 p.m.—News items; reports on stolen automobiles.  
**WUL—Doubleday-Hill Electric Co.**  
(350 Meters).  
4:30 to 5:30 p.m.—Base ball scores and the following musical program: "Remember the Rose" (S. Simons); "In Paloma" (piano) (Yradier); "To a Wild Rose" (violin) (MacDowell); "Le Papillon" (piano) (Lavalles); "Lo, Hear the Gentle Lark" (soprano) (Shakespeare); "Rhapsodie Hongroise No. 2" (piano) (Liszt); "Cavalleria Rusticana, intermezzo" (Mascagni); "Pierrot, Pieces" (piano) (Scott); "Valse, Fugue" (D'Arcy-Russell); "Rhapsodie Hongroise No. 3" (piano) (Liszt); "Africana—O Parades" (soprano) (Meyer); "Tango" (piano) (MacDowell); "Leave Me With a Smile" (soprano) (MacDowell); "Gypsy Serenade" (Valdes).

**WEE—White & Boyer Company** (350 Meters).  
7:45 p.m. (Charles Feland Gannon, director): (1) Piano selection, "Tango, Rhapsodie Hongroise" (Kreisl), played by Felix Gerds; "Die Walkure"—Wagner; "Farewell" (Wagner-Ryner), played by Ryner; "Just Because You're You" (Turk and Robinson), played by George Dillworth; "For You" (O'Reilly-Gee), played by Kaita; (2) "La Procession" (Frank); "Del Mio Dolce Ardor" (Gluck); "Little Mother and Me" (Burling); "Oh, Don't It Rain" (Burling); "George Schimmel, tenor; Mrs. Katharine Flockner Cullen, accompanist; (3) Musical reading, Miss Louise Carmody of the O'Connor School of Expression; (4) "Romances" (Svend); "Souvenir" (Bedia); "Chanson Idole" (Rimsky-Korsakov); "Hymne a Sainte Cecile" (Gounod); William Hedlund, violinist; Mrs. Katharine Flockner Cullen, accompanist; (5) Musical readings, Miss Louise Carmody of the O'Connor School of Expression; (6) "Invictus" (Hahn); "Duna" (McGill); "My Little Woman" (Sagood); "Down in the Deep, Let Me Sleep When I Die" (Petr); Francis P. Heatsell, bass; Mrs. Katharine Flockner Cullen, accompanist; (7) Musical readings, Miss Louise Carmody of the O'Connor School of Expression; (8) "Humorous" (Keller-Bella); "Cavalleria Rusticana" (Puccini); "Madame Butterfly" (Puccini); "Kashmir Song" (Woodford-Pinder); "Topsy" (Del Rio); "Love Song" (Thomas); Mrs. Fannie Heatsell, soprano; Mrs. Katharine Flockner Cullen, accompanist.

**WJZ—Westinghouse, Newark, N. J.** (350 Meters)—Eastern Daylight-Saving Time—Deduct One Hour.  
9 a.m.—Agricultural reports and prices as released by New York, New Jersey and federal bureau; program of music.  
10 a.m.—Program of music; Duo-Art recital.  
Noon.—Agricultural reports; weather forecast; program of music; Duo-Art recital.  
12:15 to 1 p.m.—Standard time signal from Arlington.  
1 p.m.—Program of music.  
2 p.m.—Program of music.  
3 p.m.—Program of music.  
4 p.m.—Base ball scores; women's fashion news; program of music.  
5 p.m.—Base ball scores; program of music.  
6 p.m.—Weather forecast; agricultural reports; program of music.  
10 a.m.—"Society of Electrical Development" by Wm. L. Goodwin.  
7 p.m.—"Man in the Moon Stories" (Newark Sunday Call).  
7:45 p.m.—"Why the Tariff Should Be Taken Out of Politics" by Joseph P. Frelinghuysen, U. S. senator, state of New Jersey.  
8 p.m.—"Humorous Aspects of an Editor's Life" by R. O. Laughlin.  
9:30 p.m.—Recital by Mabel Burris Swannstrom.

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## RADIO HALF

WHAT SAY WE HOP IN THE CAR AND TAKE A SPIN OUT INTO THE COUNTRY?

ALRIGHT

GRAB A LUNG-FULL OF THAT AIR!—'ATS WHAT I CALL WONDERFUL! I LIKE THE COUNTRY!!

LOOK AT THAT SCENE! ISN'T IT BEAUTIFUL?—WE MUST LIVE ON A FARM SOMEDAY!

YES—AND WE MUST BE PROGRESSIVE TOO—AND HAVE ELECTRIC FANS LIKE THOSE FOR OUR COWS!!

7-11 JACK WILSON

Columbia basin irrigation project, in Washington state.

The bill as originally introduced by Senator Poindexter, republican, was practically redrafted by the committee, but carried the Washington senator's request for an appropriation of \$100,000 to finance the survey and report.

Tibet is larger than France, Germany and Spain combined, but has only 5,000,000 inhabitants.

Complaint was voiced in the Senate again yesterday by Senator Harrison, democrat, Mississippi, because of the failure of President Harding to respond to a resolution adopted by the Senate April 24 calling on the executive for the names of the persons appointed to office by executive order.

"I submit that a resolution adopted nearly three months ago unanimously should be heeded," said Senator Harrison. "Unless some report is made to the Senate within a reasonable time, other action should be taken, if possible, to extract from the President the names of those appointed, in violation of civil service rules."

Capt. Walter R. Gherardi has been relieved from duty in the bureau of navigation, Navy Department, and assigned to the command of the air squadron Atlantic fleet, on the U. S. S. Wright. He will relieve Capt. Alfred W. Johnson, who will take his place in the bureau of navigation.

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## FAVOR BIG IRRIGATION.

Senators Vote \$100,000 for Survey of Columbia Basin.

The Senate committee on irrigation and reclamation yesterday ordered favorably reported a bill directing Secretary Fall to survey and report to Congress by January 1, 1924, on all essential features of the proposed only 5,000,000 inhabitants.

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